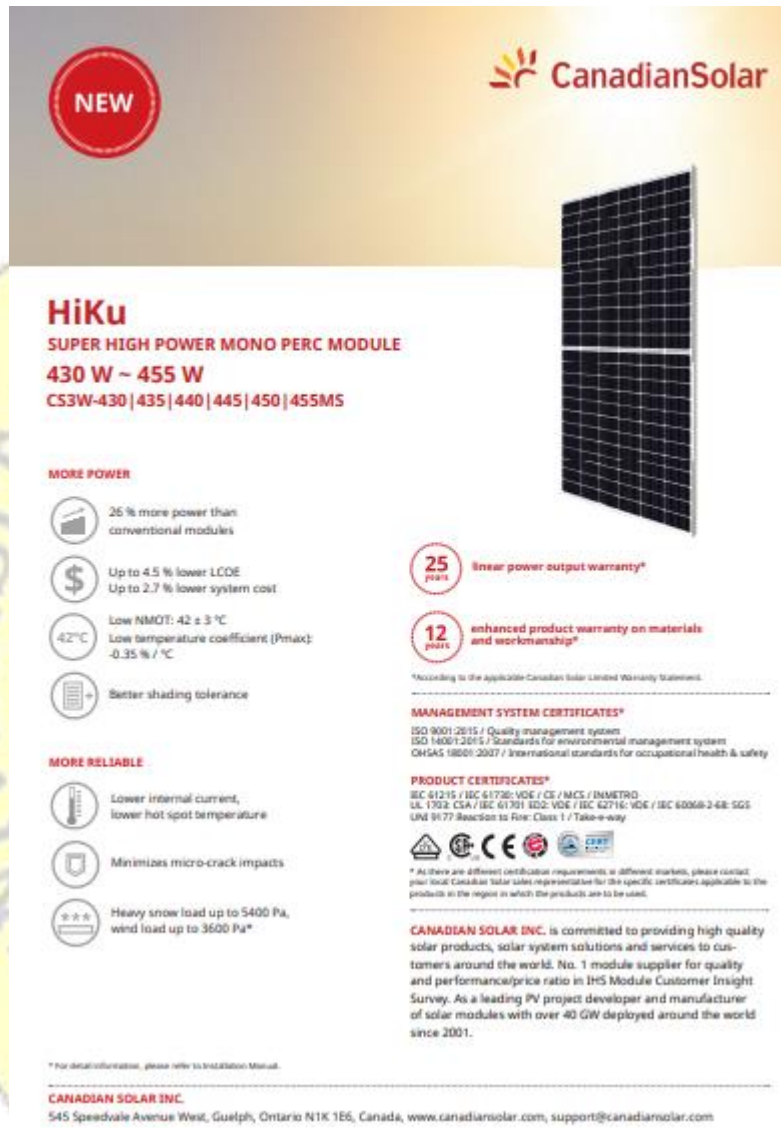


## LAMPIRAN

### Lampiran 1. Datasheet Modul PV CanadianSolar HiKu CS3W-450MS



The image shows a datasheet for the CanadianSolar HiKu CS3W-450MS solar module. The document is titled 'NEW' in a red circle and features the CanadianSolar logo at the top right. A photograph of the solar module is shown on the right side. The main title is 'HiKu SUPER HIGH POWER MONO PERC MODULE 430 W ~ 455 W CS3W-430 | 435 | 440 | 445 | 450 | 455MS'. The datasheet is divided into two main sections: 'MORE POWER' and 'MORE RELIABLE'. The 'MORE POWER' section lists: 25% more power than conventional modules, up to 4.5% lower LCOE and up to 2.7% lower system cost, low NMOT of 42 ± 3 °C, low temperature coefficient (Pmax) of -0.35 % / °C, and better shading tolerance. The 'MORE RELIABLE' section lists: lower internal current and lower hot spot temperature, minimizes micro-crack impacts, and heavy snow load up to 5400 Pa and wind load up to 3600 Pa\*. On the right side, there are two warranty icons: '25 years linear power output warranty\*' and '12 years enhanced product warranty on materials and workmanship\*'. Below these are sections for 'MANAGEMENT SYSTEM CERTIFICATES\*' (ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007) and 'PRODUCT CERTIFICATES\*' (IEC 61215, IEC 61730, VDE / CE / MCS / ENMETRO, UL 1702, CSA / IEC 61701, IEC 62716, IEC 62716, VDE / IEC 60060-2-48: SGS, IEC 61777). At the bottom, there is a note about contacting local CanadianSolar sales representatives and a company profile for CanadianSolar Inc. stating it is committed to providing high quality solar products and services, and is the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey.

**NEW**

**CanadianSolar**

**HiKu**  
SUPER HIGH POWER MONO PERC MODULE  
430 W ~ 455 W  
CS3W-430 | 435 | 440 | 445 | 450 | 455MS

**MORE POWER**

- 25% more power than conventional modules
- Up to 4.5% lower LCOE  
Up to 2.7% lower system cost
- Low NMOT: 42 ± 3 °C  
Low temperature coefficient (Pmax): -0.35 % / °C
- Better shading tolerance

**MORE RELIABLE**

- Lower internal current, lower hot spot temperature
- Minimizes micro-crack impacts
- Heavy snow load up to 5400 Pa, wind load up to 3600 Pa\*

**25 years** linear power output warranty\*

**12 years** enhanced product warranty on materials and workmanship\*

\*According to the Applicable Canadian Solar Limited Warranty Statement.

**MANAGEMENT SYSTEM CERTIFICATES\***  
ISO 9001:2015 / Quality management system  
ISO 14001:2015 / Standards for environmental management system  
OHSAS 18001:2007 / International standards for occupational health & safety

**PRODUCT CERTIFICATES\***  
IEC 61215 / IEC 61730: VDE / CE / MCS / ENMETRO  
UL 1702: CSA / IEC 61701: IEC 62716: VDE / IEC 62716: VDE / IEC 60060-2-48: SGS  
IEC 61777: Recursion to First Class 1 / Take-away

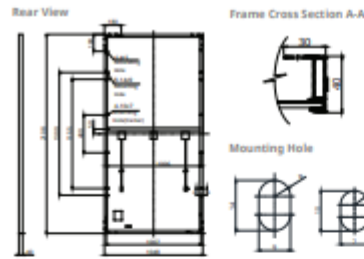
\* As there are different certification requirements in different markets, please contact your local CanadianSolar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

**CANADIAN SOLAR INC.** is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 40 GW deployed around the world since 2001.

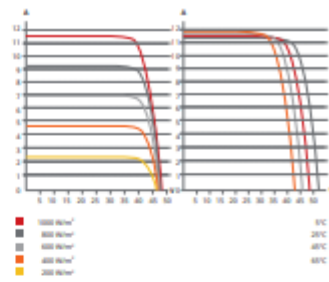
\* For detail information, please refer to the Installation Manual.

**CANADIAN SOLAR INC.**  
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, [www.canadiansolar.com](http://www.canadiansolar.com), [support@canadiansolar.com](mailto:support@canadiansolar.com)

**ENGINEERING DRAWING (mm)**



**CS3W-435MS / I-V CURVES**



**ELECTRICAL DATA | STC\***

CS3W	430MS	435MS	440MS	445MS	450MS	455MS
Nominal Max. Power (Pmax)	430 W	435 W	440 W	445 W	450 W	455 W
Opt. Operating Voltage (Vmp)	40.3 V	40.5 V	40.7 V	40.9 V	41.1 V	41.3 V
Opt. Operating Current (Imp)	10.68 A	10.75 A	10.82 A	10.89 A	10.96 A	11.02 A
Open Circuit Voltage (Voc)	48.3 V	48.5 V	48.7 V	48.9 V	49.1 V	49.3 V
Short Circuit Current (Isc)	11.37 A	11.42 A	11.48 A	11.54 A	11.60 A	11.66 A
Module Efficiency	19.5%	19.7%	19.9%	20.1%	20.4%	20.6%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)					
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)					
Max. Series Fuse Rating	20 A					
Application Classification	Class A					
Power Tolerance	0 ~ +10 W					

**ELECTRICAL DATA | NMDT\***

CS3W	430MS	435MS	440MS	445MS	450MS	455MS
Nominal Max. Power (Pmax)	321 W	325 W	328 W	332 W	336 W	339 W
Opt. Operating Voltage (Vmp)	37.6 V	37.8 V	37.9 V	38.1 V	38.3 V	38.5 V
Opt. Operating Current (Imp)	8.54 A	8.59 A	8.65 A	8.71 A	8.76 A	8.82 A
Open Circuit Voltage (Voc)	45.4 V	45.6 V	45.8 V	46.0 V	46.2 V	46.4 V
Short Circuit Current (Isc)	9.17 A	9.21 A	9.26 A	9.31 A	9.36 A	9.41 A

\* Under Nominal Module Operating Temperature (NMDT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

**MECHANICAL DATA**

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	144 [2 X (12 X 6)]
Dimensions	2108 X 1048 X 40 mm (83.0 X 41.3 X 1.57 in)
Weight	24.9 kg (54.9 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy, crossbar enhanced
J-Box	IP68, 3 bypass diodes
Cable	4 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 500 mm (19.7 in) (+) / 350 mm (13.8 in) (-); landscape: 1400 mm (55.1 in), loop-trog connection: 1670 mm (65.7 in)*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	27 pieces
Per Container (40' HQ)	594 pieces

**TEMPERATURE CHARACTERISTICS**

Specification	Data
Temperature Coefficient (Pmax)	-0.35 % / °C
Temperature Coefficient (Voc)	-0.27 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

**PARTNER SECTION**




\* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

**CANADIAN SOLAR INC.**  
540 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, [www.canadiansolar.com](http://www.canadiansolar.com), [support@canadiansolar.com](mailto:support@canadiansolar.com)

Lampiran 2. Datasheet Baterai Voz VA12-200

Datasheet



## VA12-200 12V 200AH

VRLA DEEP CYCLE BATTERY

GENERAL FEATURE

- Absorbent Glass Mat(AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- Can be mounted in any orientation.
- Computer designed lead,calcium tin alloy grid for high power density.
- Long service life,float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

SPECIFICATION

Nominal voltage ..... 12V  
 Number of cell ..... 6  
 Length(mm/inch) ..... 520/20.49  
 Width(mm/inch) ..... 240/9.46  
 Height(mm/inch) ..... 218/8.58  
 Total Height(mm/inch) ..... 222/8.74  
 Approx.Weight(kg/lbs) ..... 60/132.28

MATERIAL

Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

CONFIGURATION

Capacity 77°F(25°C)	20 hours rate (10.5A 10.8V)	210Ah
	10 hours rate (20A 10.8V)	200Ah
	5 hours rate (37.2A 10.5V)	186Ah
	1 hour rate (135A 9.6V)	135Ah
Internal Resistance	Full charged battery 77°F(25°C):3.5mΩ	
Capacity affected by Temperature (10 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(10°C)	85%
	5°F(-15°C)	65%
Self-Discharge 68°F(20°C)	Capacity after 3 month storage	90%
	Capacity after 6 month storage	80%
	Capacity after 12 month storage	60%
Max discharge current 77°F(25°C):1000A(5S)		
Charge (Constant Voltage)	Float:13.6 to 13.8V/77°F(25°C)	
	Cycle:14.4 to 14.7V/77°F(25°C)	
	Max Current:50A	

